REMARKS

Claims 1 to 27 are presently in the application. Claims 1 to 21 have been amended to more clearly and precisely define the present invention. Claims 22 to 26 have been drafted to include all of the limitations of original claims 13 to 17, which the Examiner indicated would be allowable if claims 13, 15 and 17 were rewritten in independent form. Claim 27, which is dependent on claim 26, has been added and includes the limitation of original claim 21.

The amendments are fully supported by the application as originally filed. No new matter has been introduced by way of these amendments.

In paragraph 1 of the Detailed Action, the Examiner objected to claims 1 to 21 because of the lack of a proper indefinite article at the beginning of each claim. Claims 1 to 21 have each been amended to remedy this deficiency. New claims have been drafted to include a proper indefinite article at the beginning of each claim.

In paragraphs 2 and 3 of the Detailed Action, the Examiner rejected claims1-6, 9-12 and 18-21 under 35 USC 103(a) as being unpatentable over Tomita - US Patent No. 5,086,437 in view of Kamgar - US Patent No. 6,324,387. Applicant respectfully traverses this rejection. Original claim 1 was directed to an apparatus for filtering and amplifying a received signal comprising a plurality of sequentially connected complex filter/amplifier stages. Tomita teaches a single filter/amplifier, the filter stage including I and Q channel filters 17, 18 followed by an amplifier stage having I and Q amplifiers 23, 24. Further Kamgar does not add to the teachings of Tomita by describing or inferring an apparatus having a plurality of sequentially connected complex filter/amplifier stages. If is further noted that none of the other references cited by the Examiner, namely Hariharan - US Patent No. 4,543,546, Heininen - US Patent No. 5,896,562, Izumi - US Patent No. 6,233,227, or Wynn - US Patent 6,009,317 teach or infer the apparatus defined by claim 1.

Further, in order to more clearly define the present invention, claim 1 has been amended to identify the received signal as having a desired signal portion and an interfering signal portion. Initially, the desired input signal is relatively much smaller than the interfering signals. Each stage attenuates the interference signals using a complex filter. The signal is then amplified by an AGC which amplifies both the desired signal as well as the interfering signal. As the signal passes through subsequent stages, the desired signal becomes larger relative to the interfering signal since both are amplified but only the interfering signal is attenuated by the filter. Thus, in the last stages, the desired signal becomes the dominant signal since the interfering signal is being attenuated to towards zero.

As described from page 5, line 28 to page 6, line 11, the above defined apparatus permits the complex filter/amplifier stages 14_1, 14_2, ... 14_n to act independently of one another and the stages act sequentially on the input signal so as to produce a desired output signal having a predetermined signal level H falling within a restricted dynamic range required at the output. The signal level H is achieved in the last stage 14_n by controlling the amplifier within the stage 14_n by the AGC setting 15_n. The AGC setting 15_1, 15_2, ... 15_n may be preset at specific levels and represent the projected amplitude level desired at the output of the respective amplifiers. AGC setting 15_1, 15_2, ... 15_n are used to control the gain of the respective amplifiers within their respective gain ranges. The number of stages 14_1, 14_2, ... 14_n in the cascaded structure 13 and the maximum of the gain range for each amplifier may be preset in order to obtain the total gain required over the entire cascaded structure 13 to accommodate the variety of desired input signals levels with which the receiver is expected to function properly. The gain ranges or the gain range maximums may be substantially the same, however this will not usually be the case. Each amplifier gain range may preferably be selected such that the amplifiers will operate efficiently minimizing power consumption.

The overall advantage of the present invention as defined by claim 1 is that it provides a stable filtering/amplifier structure which minimizes power consumption. Since it is capable of providing desired output signals having an amplitude level within a restricted dynamic range, further power savings may be achieved in the analog to digital converters and demodulators that follow.

It is therefore respectfully submitted that present claim 1 is patentable over Tomita - US Patent No. 5,086,437 in view of Kamgar - US Patent No. 6,324,387.

In view of the above, it is further respectfully submitted that claims 2-6, 9-12 and 18-21 are also patentable over Tomita - US Patent No. 5,086,437 in view of Kamgar - US Patent No. 6,324,387. In particular, it is not taught or inferred by Tomita that the control circuit determines the control signal as a function of the amplifier inputs in each stage as defined by claim 10 or as a function of the projected amplitude level as defined in claim 12, and therefore these limitations would not be considered to be obvious to one skilled in the art. Further, it is noted that Tomita teaches the use of a DC Blocking Circuit 25, 26 rather then a dc compensation circuit as defined by claims 18 to 20. Further, Kamgar et al teaches in col. 5, lines 57-61 that the LNA circuitry 105 provides a maximum gain of 10dB and a minimum gain of 0 dB, whereas claim 21 defines the minimum gain K_{min} as being negative.

In paragraph 4 of the Detailed Action, the Examiner rejected claims 7 and 8 under 35 USC 103(a) as being unpatentable over Tomita - US Patent No. 5,086,437 in view of Kamgar - US Patent No. 6,324,387 and Hariharan - US Patent No. 4,543,546. In view of the above amendments and arguments with respect to present claim 1, it is respectfully submitted that claims 7 and 8 are patentable.

It is therefore respectfully submitted that amended claims 1 to 21 are unobvious and comply with the requirements of 35 USC 103(a).

In paragraph 5 of the Detailed Action, the Examiner indicated that claims 13 -17 would be allowable if rewritten in independent form. New claims 22 to 26 correspond to original claims 13 to 17 including all of the limitations of the original base claim and any intervening claims. In addition, claim 27, which is dependent on claim 26, includes the limitation of original claim 21. It is therefore respectfully submitted that claims 22 to 27 are allowable.

CONCLUSION

For the reasons set forth above, it is respectfully submitted that all pending claims are now in condition for allowance, and Applicant requests a Notice of Allowance be issued in this case. Should there be any further questions or concerns, the Examiner is urged to telephone the undersigned to expedite prosecution.

Respectfully submitted,
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